

WHAT IS CLAIMED IS:

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1. A semiconductor device having a built-in contact-type sensor, comprising:

a semiconductor element including a built-in contact-type sensor having a sensor area formed
10 on a circuit formation surface and connection terminals provided in an area other than the sensor area;

15 a wiring board connected to the connection terminals of the semiconductor element so that an end surface of the wiring board is positioned on said circuit formation surface; and

a protective resin part covering a part extending from the end surface of said wiring board to said circuit formation surface.

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2. A semiconductor device having a built-in contact-type sensor, comprising:

a semiconductor element including a built-in contact-type sensor having a sensor area formed
25 on a circuit formation surface and connection terminals provided in an area other than the sensor area;

30 a wiring board connected to the connection terminals of the semiconductor element so that an end surface of the wiring board is positioned on said circuit formation surface; and

35 a resin filled between said wiring board and said semiconductor element and covering said end surface of the wiring board.

3. A semiconductor device having a built-in contact-type sensor, comprising:

a semiconductor element including a built-in contact-type sensor having a sensor area formed on a circuit formation surface and connection terminals provided in an area other than the sensor area; and

10 a wiring board connected to the connection terminals of the semiconductor element so that an end surface of the wiring board is positioned on said circuit formation surface,

15 wherein said end surface of the wiring board positioned on said circuit formation surface forms an inclined surface with respect to said circuit formation surface.

20 4. The semiconductor device having a built-in contact-type sensor as claimed in claim 3, wherein a conductive part is formed in the vicinity of said oblique surface on a surface opposite to a surface of said wiring board facing said 25 semiconductor element, and the conductive part is electrically connected to grounding wires included in wires formed on said wiring board.

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5. A semiconductor device having a built-in contact-type sensor, comprising:

35 a semiconductor element including a built-in contact-type sensor having a sensor area formed on a circuit formation surface and connection terminals provided in an area other than the sensor

area; and

a wiring board having wires on a surface facing the semiconductor element and connected to the connection terminals of the semiconductor
5 element so that an end surface of the wiring board is positioned on said circuit formation surface,

wherein a conductive part is formed in the vicinity of said end surface of said wiring board on a surface opposite to the surface of said wiring
10 board facing said semiconductor element, and the conductive part is electrically connected to grounding wires included in the wires formed on said wiring board.

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6. A manufacturing method of a semiconductor device having a built-in contact-type
20 sensor, the semiconductor device having a semiconductor element including a built-in contact-type sensor having a sensor area formed on a circuit formation surface and connection terminals provided in an area other than the sensor area, a wiring
25 board connected to the connection terminals of the semiconductor element so that an end surface of the wiring board is positioned on said circuit formation surface, a protective resin part covering a part extending from the end surface of said wiring board
30 to said circuit formation surface,

the manufacturing method comprising the steps of:

removing a part of a base material sheet of said wiring board and forming said wiring board
35 in said base material sheet in a state where a part of said wiring board is connected to said base material sheet;

locating said semiconductor element over an end surface of said wiring board formed in said base material sheet and a part of said base material sheet other than said wiring board;

5 connecting connection electrodes of said semiconductor element to electrodes formed on said end surface of said wiring board; and

10 cutting a part of said wiring board connected to said base material sheet so as to separate said wiring board from said base material sheet.

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7. The manufacturing method as claimed in claim 6, wherein the step of locating said semiconductor element includes a step of placing said base material sheet on a bonding stage having a 20 first surface and a second surface, a step corresponding to a height of the connection electrodes of said semiconductor element formed between the first surface and said second surface so that said end surface of said wiring board is placed 25 on said first surface and a part of said wiring board other than said end surface of said wiring board is placed on said second surface.

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8. A manufacturing method of a semiconductor device having a built-in contact-type sensor, the semiconductor device having a 35 semiconductor element including a built-in contact-type sensor having a sensor area formed on a circuit formation surface and connection terminals provided

in an area other than the sensor area, a wiring board connected to the connection terminals of the semiconductor element so that an end surface of the wiring board is positioned on said circuit formation surface, a resin filled between said wiring board and said semiconductor element and covering said end surface of the wiring board,

5 the manufacturing method comprising the steps of:

10 removing a part of a base material sheet of said wiring board and forming said wiring board in said base material sheet in a state where a part of said wiring board is connected to said base material sheet;

15 locating said semiconductor element over an end surface of said wiring board formed in said base material sheet and a part of said base material sheet other than said wiring board;

20 connecting the connection terminals of said semiconductor element to electrodes formed on said end surface of said wiring board; and

25 cutting a part of said wiring board connected to said base material sheet so as to separate said wiring board from said base material sheet.

30 9. The manufacturing method as claimed in claim 8, wherein the step of locating said semiconductor element includes a step of placing said base material sheet on a bonding stage having a first surface and a second surface, a step
35 corresponding to a height of the connection electrodes of said semiconductor element formed between the first surface and said second surface so

that said end surface of said wiring board is placed on said first surface and a part of said wiring board other than said end surface of said wiring board is placed on said second surface.

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10. A manufacturing method of a
10 semiconductor device having a built-in contact-type
sensor, the semiconductor device having a
semiconductor element including a built-in contact-
type sensor having a sensor area formed on a circuit
formation surface and connection terminals provided
15 in an area other than the sensor area, a wiring
board connected to the connection terminals of the
semiconductor element so that an end surface of the
wiring board is positioned on said circuit formation
surface, said end surface of the wiring board
20 positioned on said circuit formation surface forms
an oblique surface with respect to said circuit
formation surface,

the manufacturing method comprising the
steps of:

25 removing a part of a base material sheet
of said wiring board and forming said wiring board
in said base material sheet in a state where a part
of said wiring board is connected to said base
material sheet;

30 locating said semiconductor element over
an end surface of said wiring board formed in said
base material sheet and a part of said base material
sheet other than said wiring board;

35 connecting the connection terminals of
said semiconductor element to electrodes formed on
said end surface of said wiring board; and
cutting a part of said wiring board

connected to said base material sheet so as to separate said wiring board from said base material sheet.

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11. The manufacturing method as claimed in claim 10, wherein the step of locating said semiconductor element includes a step of placing said base material sheet on a bonding stage having a first surface and a second surface, a step corresponding to a height of the connection electrodes of said semiconductor element formed between the first surface and said second surface so that said end surface of said wiring board is placed on said first surface and a part of said wiring board other than said end surface of said wiring board is placed on said second surface.

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12. A manufacturing method of a semiconductor device having a built-in contact-type sensor, the semiconductor device having a semiconductor element including a built-in contact-type sensor having a sensor area formed on a circuit formation surface and connection terminals provided in an area other than the sensor area, a wiring board having wires on a surface facing the semiconductor element and connected to the connection terminals of the semiconductor element so that an end surface of the wiring board is positioned on said circuit formation surface, a conductive part formed in the vicinity of said end surface of said wiring board on a surface opposite

to the surface of said wiring board facing said semiconductor element, the conductive part electrically connected to grounding wires included in the wires formed on said wiring board,

5 the manufacturing method comprising the steps of:

removing a part of a base material sheet of said wiring board and forming said wiring board in said base material sheet in a state where a part 10 of said wiring board is connected to said base material sheet;

locating said semiconductor element over an end surface of said wiring board formed in said base material sheet and a part of said base material sheet other than said wiring board;

15 connecting the connection terminals of said semiconductor element to electrodes formed on said end surface of said wiring board; and

20 cutting a part of said wiring board connected to said base material sheet so as to separate said wiring board from said base material sheet.

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13. The manufacturing method as claimed in claim 12, wherein the step of locating said semiconductor element includes a step of placing said base material sheet on a bonding stage having a 30 first surface and a second surface, a step corresponding to a height of the connection electrodes of said semiconductor element formed between the first surface and said second surface so that said end surface of said wiring board is placed 35 on said first surface and a part of said wiring board other than said end surface of said wiring board is placed on said second surface.